

REMARKS/ARGUMENTS

The Office Action (1) requested clarification for “horizontal movement of the lid”, and “floating pivot”, (2) rejected claim 24 under 35 U.S.C. 102(e) as being unpatentable by Pang et al. (U.S. 6,517,634), (3) rejected claim 25 under 35 U.S.C. 103(a) as being unpatentable over Pang et al., in view of Kamikawa et al. (U.S. 6,413,355), (4) rejected claims 1-8 under 35 U.S.C. 103(a) as being unpatentable over Pang et al., in view of Kamikawa et al., (5) rejected claim 9 under 35 U.S.C. 103(a) as being unpatentable over Pang et al., in view of Lei et al. (U.S. 6,050,446), and objected to claims 10 and 26.

1a. With respect to the examiner’s question about the clarification of the claim language “horizontal movement of the lid substantially parallel to the chamber opening”, applicant has modified the claim, replacing “horizontal” with “translational”. The words “translational movement” means that the lid moves while keeping the orientation. Thus the lid would not rotate during the movement.

The enclosed figure sequence 1A-1D shows the movement of the lid from a close position to an open position.

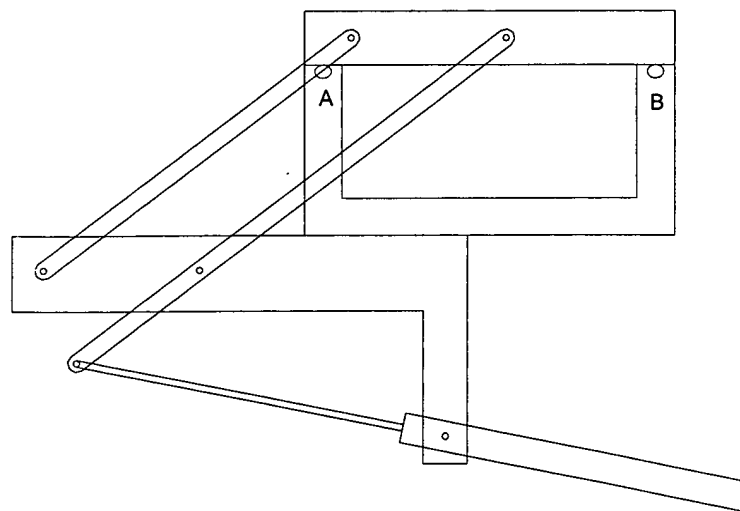


Fig. 1A. Lid in close position

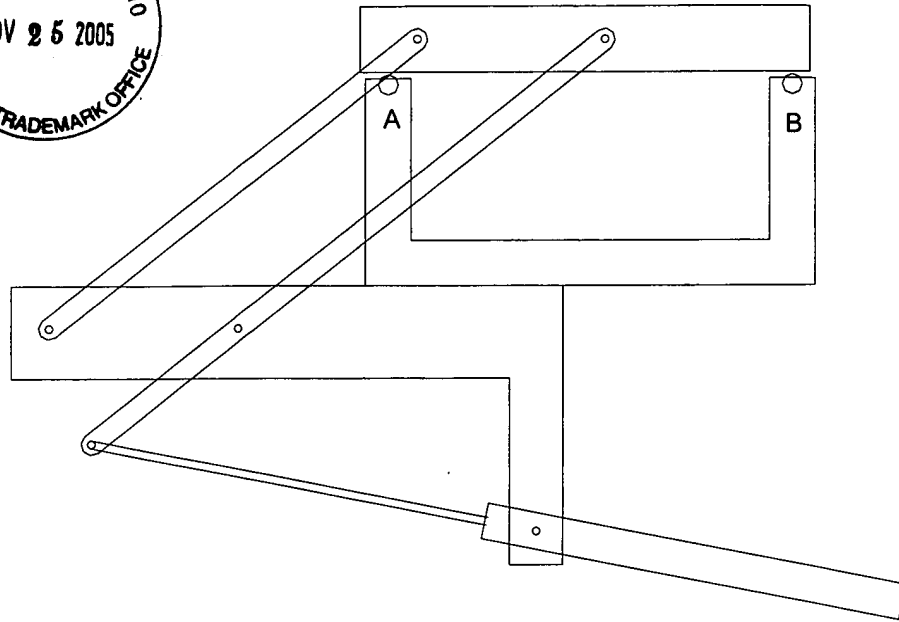


Fig. 1B. At the beginning of movement

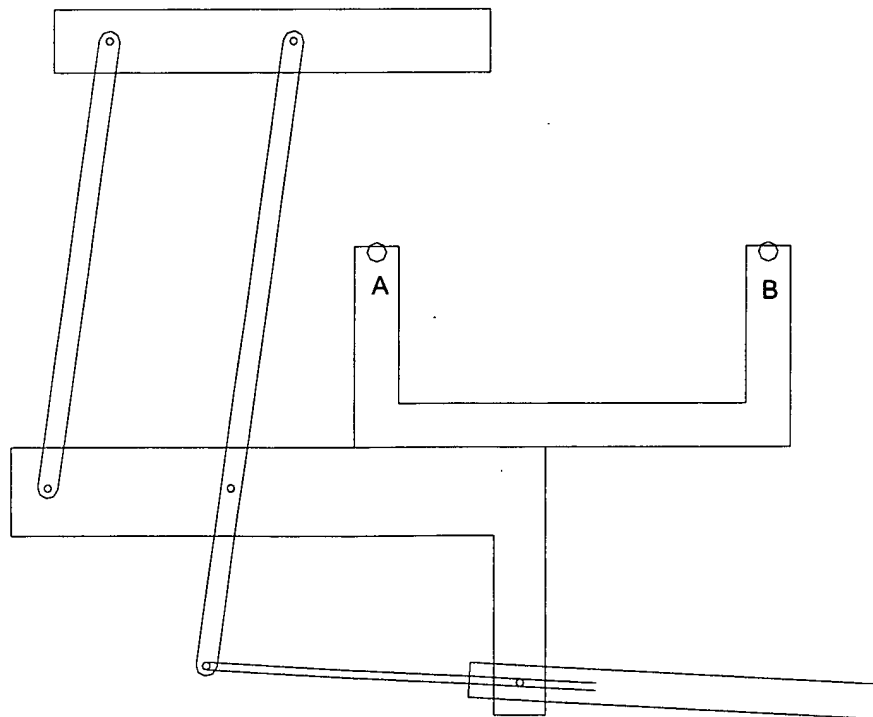


Fig. 1C. Half way open

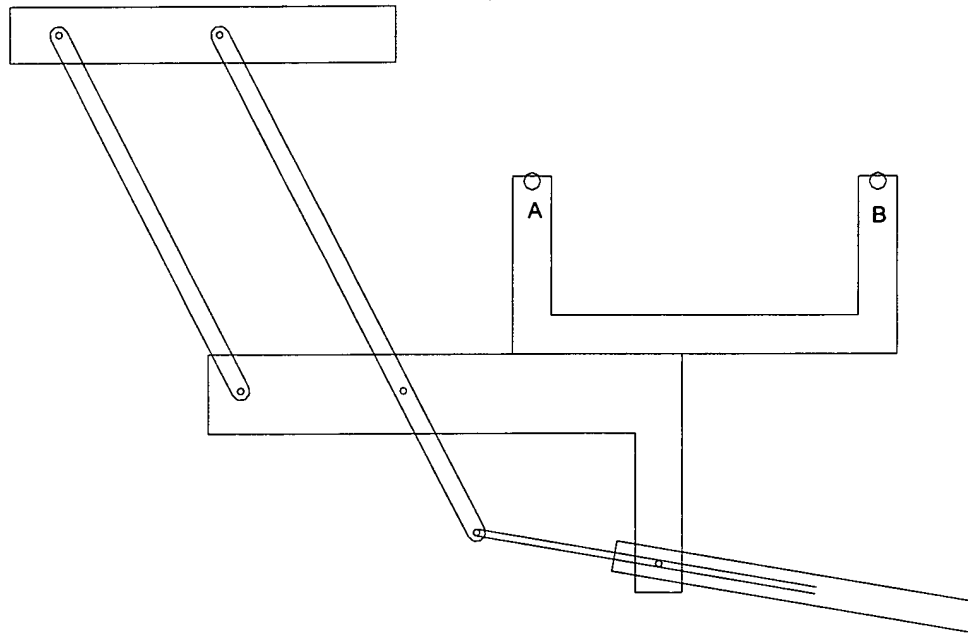


Fig. 1D. Lid in open position

As can be seen from the sequence of Fig. 1A-1D, the lid is moving translational, not rotational, from the close position to the open position. The lid orientation is preserved during the movement. The translation movement is substantially parallel to the chamber opening, with some perpendicular component. The translational movement of the lid prevent the “pinching” effect of the o-rings A and B, since there is no shear force acting on these o-rings.

In contrast, Pang et al.’s lid movement is mainly rotational, as shown in the following picture sequence 2A-2D.

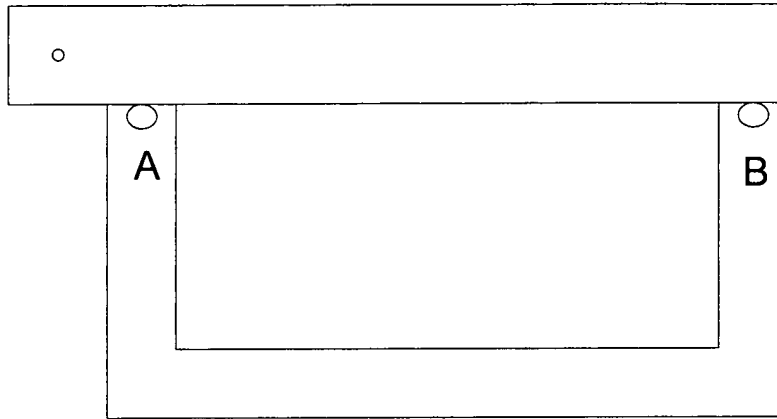


Fig. 2A. Lid in close position (Pang et al.)

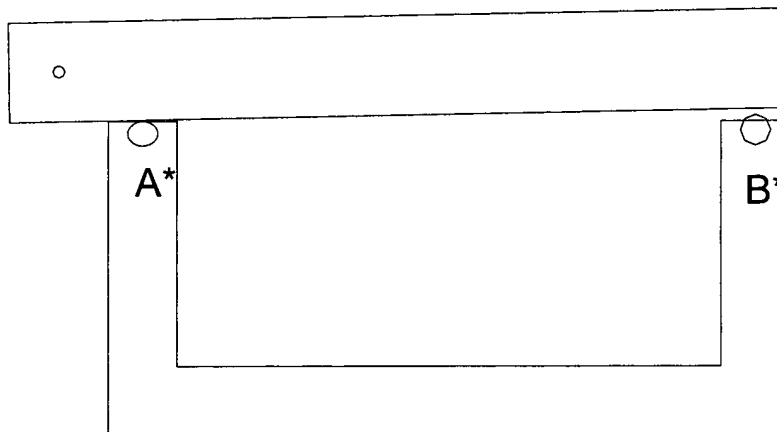


Fig. 2B. At the beginning of movement (Pang et al.)

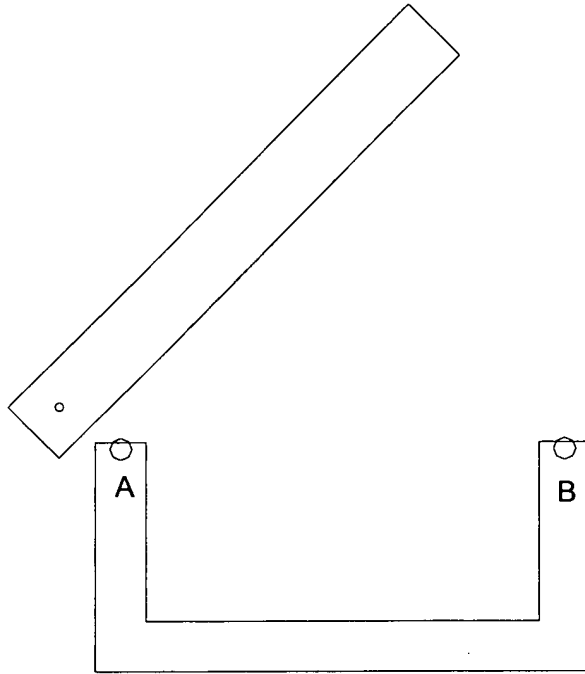


Fig. 2C. Half way open (Pang et al.)

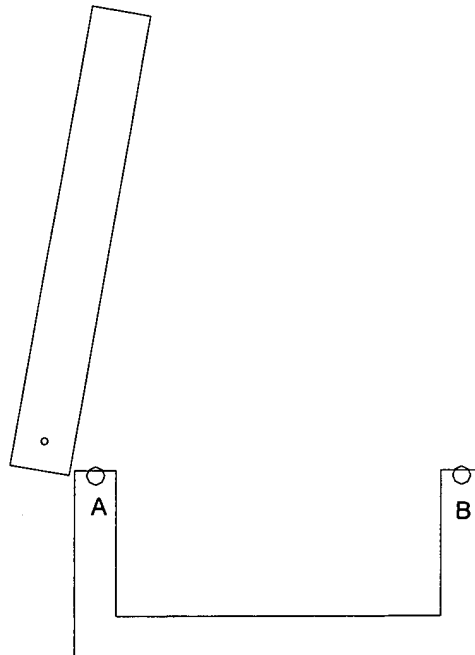


Fig. 2D. Lid in open position (Pang et al.)

As can be seen in this sequence of figures 2A-2D, the lid of Pang et al. is moving rotationally. The major disadvantage of rotational lid is the “pinching” effect of o-rings

A and B, shown in Fig. 2B, labeled A* and B*, due to different forces acting on these o-rings.

To solve the “pinching” problem, Pang et al. discloses a dual pivot, as shown in Fig. 3 below.

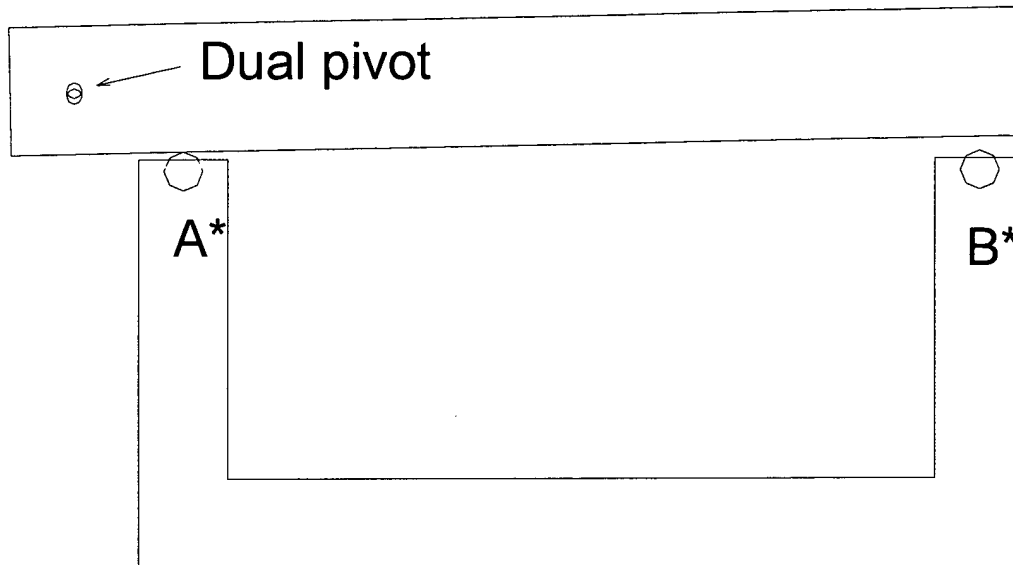


Fig. 3. Dual pivot to prevent pinching (Pang et al.)

The dual pivot is a pivot with two axis of rotation. The purpose of the dual pivot is to allow a radial movement, in addition to rotational movement, to move the lid up at the beginning of the open movement.

Thus applicant submits that the present invention provides a lid having translational movement in a manner substantial parallel to the chamber opening. In contrast, Pang et al. provides a lid having rotational movement.

1b. With respect to the examiner’s question about the clarification of the claim language “floating pivot”, applicant has modified the claim, adding the definition of a floating pivot.

Pivot, in the conventional means, is a fixed pivot. The basic example of a pivot is a ball bearing. The ball bearing allows the freedom of the center rotational movement with

respect to the outer shell. There is no radial movement, nor axial movement possible in a fixed pivot.

There is a special kind of pivot that allows radial (one direction or two directions), axial or a combination of radial and axial movement, in addition to the rotational movement. Pang et al. discloses a dual pivot (abstract, line 5; Fig. 7). The basic feature of the dual pivot disclosed by Pang et al. is that the hole 356 is larger than the rod 258 as shown in a typical Fig. 3 of Pang et al. Since the hole is larger than the rod, not only the rod can rotate, but also can move freely inside the hole, thus accomodating a lateral movement. The main disadvantages of dual pivot is the possible abrasive of the rod bumping into the hole, and the uncertainty of the rotational axis.

The present invention discloses a floating pivot that is self-centering. One embodiment of the floating pivot is a rod embedded in a thick, fat, polymeric o-ring. The elasticity of the o-ring allows the rod to be self-centered. Plus the softness of the o-ring (as compared to the solid rod) allows the rod to move somewhat, pushing the o-ring radially. Generally speaking, the floating pivot has a smaller range of lateral movement as compared to the dual pivot.

With that definition of the floating pivot (and also of the dual pivot), applicant submits that Kamikawa et al. discloses a combination of fixed pivots for items #68 and #69. Applicant submits that the movements of a plurality of fixed pivots and a plurality of components do not qualify for a floating or dual pivot.

2. With regard to the rejection of claim 24 under 35 U.S.C. 102(e) as being unpatentable by Pang et al., applicant has amended the claim. Applicant submits that the newly claim provides a chamber lid that can move translationally, in contrast to Pang et al.'s disclosure where the chamber lid moves rotationally.

Thus applicant submits that Pang et al. fails to teach or suggest an element of the claim 24 of the present invention, namely the translational movement of the lid to preserve the lid's orientation. Thus applicant submits that the present invention is patentable over Pang et al.

3. Regarding the rejection of claim 25 under 35 U.S.C. 103(a) as being unpatentable by Pang et al. in view of Kamikawa et al., applicant submit that both cited prior arts do not disclose the translational movement of the lid, nor the self-centering floating pivot of the present invention.

Applicant submits that Pang et al. employs rotational movement of the lid (as shown in Figs. 2A-2D). Also, Figs. 4A-4D below show the rotational movement of the lid in Kamikawa et al.

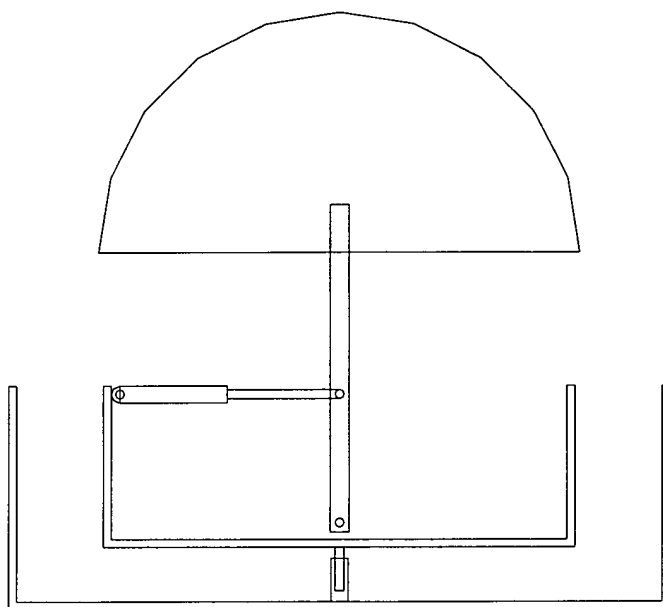


Fig. 4A. Lid in close position (Kamikawa et al.)

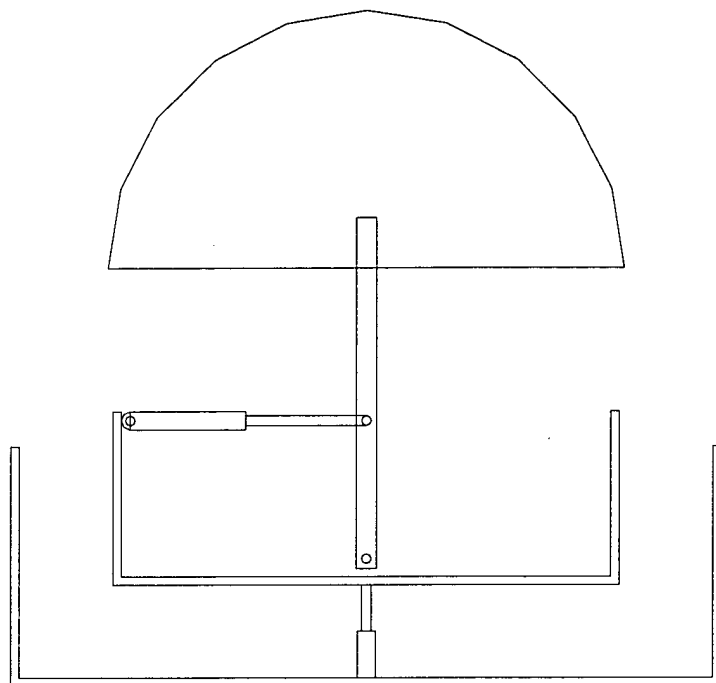


Fig. 4B. Upward movement #1 (Kamikawa et al.)

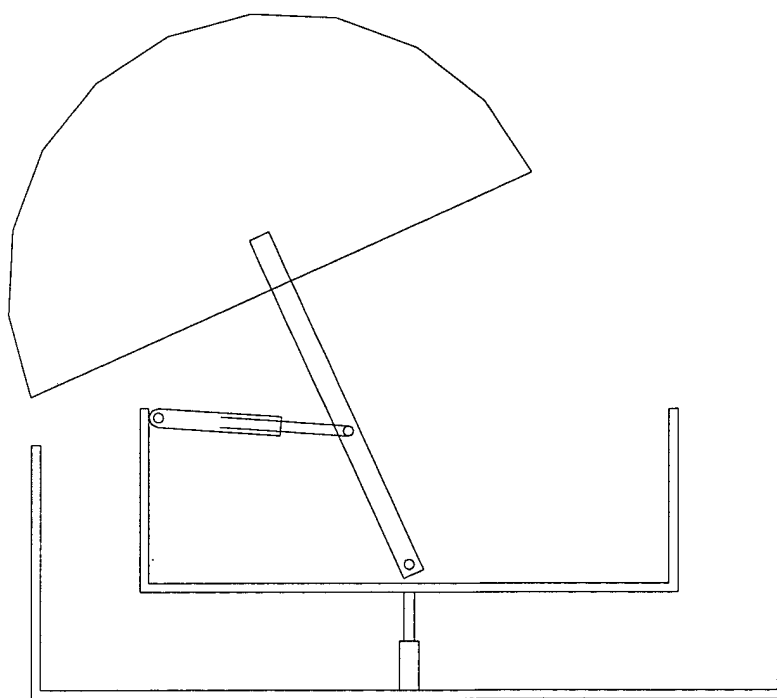


Fig. 4C. Rotation movement #2 (Kamikawa et al.)

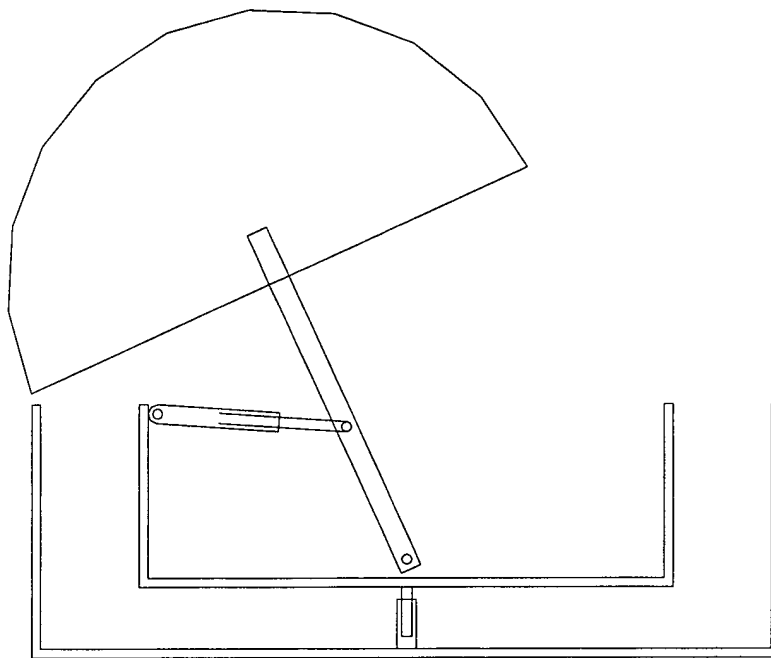


Fig. 4D. Downward movement #3 (Kamikawa et al.)

The lid movements of Kamikawa et al. comprise two actions, an upward movement (col. 8, line 27) and downward movement (col. 8, line 30), actuated by element 69, and a rotational movement (col. 8, line 28), actuated by element 68. Applicant submits since the rod 67 is fixed to the lid 63 (col. 8, line 22), the rotation action of the rod 67 results in the rotational movement of the lid 63.

Thus applicant submits that both Pang et al. and Kamikawa et al. employ rotational movement to move the lid, in contrast to the present invention translational movement.

Further Pang et al. employs a dual pivot, which is not self-centering (as discussed above). Kamikawa et al. is silent with respect to the kind of pivot employed, but since the conventional meaning of pivot is fixed pivot, plus the lid action of Kamikawa et al. can be explained using fixed pivot (Figs. 4A-4D), applicant submits that Kamikawa et al. does not teach the use of self-centering floating pivot. As discussed above, applicant

submits that the collective alignment mechanism of Kamikawa et al. does not work together to create the self-centering floating pivot of the present invention.

4. Regarding the rejection of claims 1-8 under 35 U.S.C. 103(a) as being unpatentable by Pang et al. in view of Kamikawa et al., applicant submit that both cited prior arts do not disclose the self-centering floating pivot of the present invention, as discussed in (3) above.

5. Regarding the rejection of claim 9 under 35 U.S.C. 103(a) as being unpatentable by Pang et al. in view of Lei et al., applicant submit that both cited prior arts do not disclose the self-centering floating pivot of the present invention, as discussed in (3) above.

In sum, applicant submits that Pang et al., Kamikawa et al, and Lei et al. employ a lid using rotational movement instead of translational movement. Further all the cited prior arts of Pang et al., Lei et al. and Kamikawa et al., are silent with respect to the floating pivot disclosed by the present invention. Thus applicant submits that the present invention chamber lid using translational movement and a floating pivot for automatic alignment is patentable over the cited prior arts.

New claim 27 includes a combination of claim 1 and allowed claim 10. New Claim 28 includes a combination of claims 24, 25 and allowed claim 26.

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

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